REMARKS

The final Office Action dated August 7, 2007, and the patents cited therein have been carefully reviewed, and in view of the above changes and following remarks reconsideration and allowance of all the claims pending in the application are respectfully requested.

Claims 1-5, 7, 8, 11-16, 23-25 and 27-29 stand rejected. Claims 9, 10 and 17-22 stand withdrawn from consideration. By this Amendment, claims 30 and 31 have been added so that now claims 1-5, 7, 8, 11-16, 23-25 and 27-31 are pending.

The Rejection Under 35 U.S.C. §§ 102(e) and 103(a) Over Ravelosona-Ramasitera

Claim 1-5, 7, 8, 11, 14-16, 23-25 and 27-29 stand finally rejected under 35 U.S.C. §§ 102(e) and 103(a) as anticipated by or, in the alternative, as obvious over Ravelosona-Ramasitera et al. (Ravelosona-Ramasitera), U.S. Patent No. 6,605,321.

Applicants respectfully traverse this rejection. Applicants respectfully submit that the subject matter according to any of claims 1-5, 7, 8, 11, 14-16, 23-25 and 27-29 is not anticipated by and is patentable over Ravelosona-Ramasitera.

Regarding claim 1 and with respect to the issue of anticipation, Applicants respectfully submit that Ravelosona-Ramasitera does not disclose a method comprising irradiating a magnetic medium with ions having an acceleration voltage of between 10 keV and 50 keV to induce exchange coupling between grains of the magnetic medium. In contrast, Ravelosona-Ramasitera discloses a method for enabling a material to change from one phase to a more ordered phase by irradiating the material by low energy ions having an energy of the order of one or two hundred keV. (See Ravelosona-Ramasitera, column 2, lines 9-11.) Moreover, the Examiner admits that the claimed acceleration voltage range is not disclosed by Ravelosona-Ramasitera. (See final Office Action dated August 7, 2007, page 3, lines 14-15.) Accordingly, the claimed subject matter of claim 1 is not anticipated by Ravelosona-Ramasitera.

Regarding claim 1 and with respect to the issue of patentability, Applicants respectfully submit that:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.
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> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (See, also, MPEP §§ 706.02(j) and 2143).

Regarding the first basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit that, contrary to the Examiner's assertion, Ravelosona-Ramasitera provides no suggestion or motivation to modify the disclosed Ravelosona-Ramasitera method "to use a lower acceleration voltage based on the desired structural modifications of the irradiated material since adjusting acceleration voltage of ions was well-known to those of ordinary skill in the art at the time of the invention." (See final Office Action dated August 7, 2007, page 22-25.)

The Examiner admits that the claimed acceleration voltage range is not disclosed by Ravelosona-Ramasitera. (See final Office Action dated August 7, 2007, page 3, lines 14-15.) At best, Ravelosona-Ramasitera generally discloses a method for irradiating a "material by low energy ions having an energy of the order of one or two hundred keV." (See Ravelosona-Ramasitera, column 2, lines 9-11.) In particular, Ravelosona-Ramasitera discloses an example of using "low energy ions, such as He ions accelerated in a focused ion beam with an energy 130 keV." (See Ravelosona-Ramasitera, column 4, lines 25-26.) Ravelosona-Ramasitera is silent regarding using ions having an acceleration voltage less than the range of one or two hundred keV. The Examiner does not specifically indicate where Ravelosona-Ramasitera suggests any such modification of the Ravelosona-Ramasitera method to use an acceleration voltage that is less than the disclosed range of one or two hundred keV. Thus, Ravelosona-

Ramasitera does not provide a suggestion or motivation to modify the method disclosed by Ravelosona-Ramasitera as proffered by the Examiner.

If a suggestion or motivation to modify Ravelosona-Ramasitera as proffered by the Examiner were to exist, such a suggestion or motivation must be provided in the knowledge generally available to one of ordinary skill in the art. In this regard, the Examiner makes reference to U.S. Patent No. 6,368,425 to Segar apparently as an example of knowledge generally available to one of ordinary skill in the art. In particular, the Examiner "notes that it is well-known in the prior art to adjust acceleration voltage of ions within a wide range for use in treating magnetic media," and refers to Segar as an example of a teaching of adjusting acceleration voltage between a broad range of 2-500 keV. The Examiner then states that "it is clear that the state of the prior art is such that optimizing acceleration voltage within wide limits was known at the time of invention." (See final Office Action dated August 7, 2007, page 5, lines 12-17.)

Applicant respectfully submits that it should be noted that U.S. Patent No. 6,368,425 to Segar relates to ion treatment of a magnetic medium for improving the tribology performance of the magnetic medium, not for improving exchange coupling between grains of the magnetic medium. Consequently, the example of Segar only demonstrates that is well-known in the prior art to adjust the acceleration voltage of ions within a wide range for use for improving tribology performance of the magnetic media and is really not as relevant to the concept of exchange coupling and/or the claimed subject matter of the present patent application as is suggested by the Examiner.

The Examiner argues that it would have been obvious to optimize the acceleration voltage taught by Ravelosona-Ramasitera (apparently in view of the knowledge exemplified by Segar) to control the structural modifications of the irradiated material and, thus, adjust the acceleration voltage of the claimed ions. Applicants respectfully submit that it appears that the Examiner is ignoring that the complete disclosure of Ravelosona-Ramasitera teaches away from the Examiner's proffered modification of Ravelosona-Ramasitera in view of the knowledge generally available to one of ordinary skill in the art as exemplified by Segar.. That is, contained

within one of the portions of Ravelosona-Ramasitera relied on by the Examiner to conclude that the claimed acceleration voltage range is obvious, Ravelosona-Ramasitera states that

> the inventors used low energy ions, such as He ions accelerated in a focused ion beam with an energy of 130 keV. *It is important to note that all the He ions thus stop in the substrate*. (See Ravelosona-Ramasitera, column 4, lines 24-27, italics added.)

It should be noted that the acceleration voltage used by Ravelosona-Ramasitera caused the He ions to pass through the magnetic medium in order for all of the He ion to "stop in the substrate." Thus, "optimizing" the acceleration voltage of the ions to arrive at the claimed subject matter, as the Examiner would have it, is, in actuality, inconsistent with the actual disclosure of Ravelosona-Ramasitera regardless of whatever knowledge is exemplified by Segar. Ravelosona-Ramasitera teaches away from the claimed subject matter because Ravelosona-Ramasitera (1) sets forth a particular range of acceleration voltages that is greater than the claimed acceleration voltage range and (2) states "[i]t is important to note that all the He ions thus stop in the substrate." (See Ravelosona-Ramasitera, column 4, lines 24-27.) Thus, in contrast to the claimed subject matter, Ravelosona-Ramasitera "optimizes" the acceleration voltage of ions so that all of the ions stop in the substrate, not the magnetic medium. It would seem that if Ravelosona-Ramasitera were "optimized" to use the claimed acceleration voltage range, as urged by the Examiner, all of the ions would not stop in the substrate as disclosed by Ravelosona-Ramasitera. Instead, the vast majority of the ions would stop in the magnetic medium. Plainly, the Examiner's modification of Ravelosona-Ramasitera is inconsistent with the disclosure of Ravelosona-Ramasitera.

Regarding the third basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit that Ravelosona-Ramasitera does not disclose or suggest a method comprising irradiating the magnetic medium with ions having an acceleration voltage of between 10 keV and 50 keV to induce exchange coupling between grains of the magnetic medium. Ravelosona-Ramasitera only discloses a method using low energy ions having an energy of the order of one or two hundred keV." (See Ravelosona-Ramasitera, column 2,

lines 9-11.) Applicants have already demonstrated that the Examiner admits that the claimed acceleration voltage range is not disclosed by Ravelosona-Ramasitera. (See final Office Action dated August 7, 2007, page 3, lines 14-15.)

Thus, claim 1 is allowable over Ravelosona-Ramasitera. It follows that claims 2-5, 7, 8, 11 and 14-16, which each incorporate the limitations of claim 1, are each allowable over Ravelosona-Ramasitera for at least the same reasons that claim 1 is considered allowable.

Regarding claim 4, Applicants respectfully submit that claim 4 is allowable over Ravelosona-Ramasitera for the additional reason that Ravelosona-Ramasitera does not disclose or suggest that the claimed ions are selected from the group consisting of Ga^+, Hg^+, and In^+. Instead, Ravelosona-Ramasitera only discloses (and claims) that the low energy ions are ions that have a mass below or equal to 16 atomic mass units. (See Ravelosona-Ramasitera, column 2, lines 15-6, column 6, line 67, through column 7, line 5, and column 8, lines 20-25.)

Regarding claim 23 with respect to the issue of anticipation, Applicants respectfully submit that the subject matter of claim 23 is not anticipated by Ravelosona-Ramasitera for reasons that are similar to the reasons that the subject matter of claim 1 is considered to not be anticipated by Ravelosona-Ramasitera. Accordingly, the claimed subject matter of claim 23 is not anticipated by Ravelosona-Ramasitera.

Regarding claim 23 and with respect to the issue of patentability, Applicants respectfully submit that claim 23 is patentable over Ravelosona-Ramasitera for reasons that are similar to the reasons that claim 1 is considered patentable over Ravelosona-Ramasitera. It follows that claims 24, 25 and 27-29, which each incorporate the limitations of claim 23, are each patentable over Ravelosona-Ramasitera for at least the same reasons that claim 23 is considered patentable over Ravelosona-Ramasitera.

Regarding claim 25, Applicants respectfully submit that claim 25 is patentable over Ravelosona-Ramasitera for the additional reason that Ravelosona-Ramasitera does not disclose or suggest that the claimed ions are selected from the group consisting of Ga^+, Hg^+, and In^+. Instead, Ravelosona-Ramasitera only discloses (and claims) that the low energy ions are ions that

have a mass below or equal to 16 atomic mass units. (See Ravelosona-Ramasitera, column 2, lines 15-6, column 6, line 67, through column 7, line 5, and column 8, lines 20-25.)

Thus, Applicants respectfully submit that it is only by impermissible hindsight that the Examiner is able to reject claim 1-5, 7, 8, 11, 14-16, 23-25 and 27-29. Ravelosona-Ramasitera does not provide a suggestion for modifying Ravelosona-Ramasitera to form the claimed subject matter. Further, Ravelosona-Ramasitera, in actuality, teaches away from the particular knowledge alleged by the Examiner to be generally available to one of ordinary skill in the art for modifying Ravelosona-Ramasitera. Moreover, Ravelosona-Ramasitera does not disclose or suggest the subject matter of claim 1-5, 7, 8, 11, 14-16, 23-25 and 27-29. It is only by using Applicants' disclosure as a template that the Examiner is able to select particular features of Ravelosona-Ramasitera through a hindsight reconstruction of Applicants' claims to make the rejection.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection and allow claims 1-5, 7, 8, 11, 14-16, 23-25 and 27-29.

The Rejection Under 35 U.S.C. § 103(a) Over Ravelosona-Ramasitera In View Of Baglin

Claims 12 and 13 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Ravelosona-Ramasitera in view of Baglin et al. (Baglin), U.S. Patent No. 6,331,364.

Applicants respectfully traverse this rejection. Applicants respectfully submit that the subject matter according to claims 12 and 13 is patentable over Ravelosona-Ramasitera in view of Baglin. In particular, Applicants respectfully submit that Baglin does not cure the deficiencies of Ravelosona-Ramasitera with respect to claim 1, the base claim of both claims 12 and 13.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection and allow claims 12 and 13.

Newly Added Claims

Applicants have added new claims 30 and 31. Support for new claims 30 and 31 can be found throughout the specification, for example, at least in originally filed claims 2, 4, 24 and 25.

Applicants respectfully submit that each of new claims 30 and 31 are patentable over Ravelosona-Ramasitera for at least the same reasons that their respective base claims are considered patentable over Ravelosona-Ramasitera. Additionally, Ravelosona-Ramasitera discloses (and claims) that the low energy ions are ions that have a mass below or equal to 16 atomic mass units. (See Ravelosona-Ramasitera, column 2, lines 15-6, column 6, line 67, through column 7, line 5, and column 8, lines 20-25.)

Consequently, Applicants respectfully request that the Examiner allow new claims 30 and 31.

Applicants respectfully note that additional patentable distinctions between Ravelosona-Ramasitera and Baglin and the rejected claims exist; however, the foregoing is believed sufficient to address the Examiner's rejections. Additionally, failure of the Applicants to respond to a position taken by the Examiner is not an indication of acceptance or acquiescence of the Examiner's position. Instead, it is believed that the Examiner's positions are rendered moot by the foregoing and, therefore, it is believed not necessary to respond to every position taken by the Examiner with which Applicants do not agree.

CONCLUSION

In view of the above amendments and arguments which present the claims in better form for consideration on appeal, it is urged that the present application is now in condition for allowance. Should the Examiner find that a telephonic or personal interview would expedite passage to issue of the present application, the Examiner is encouraged to contact the undersigned attorney at the telephone number indicated below.

It is requested that this application be passed to issue with claims 1-5, 7-25 and 27-31.

Respectfully submitted,

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